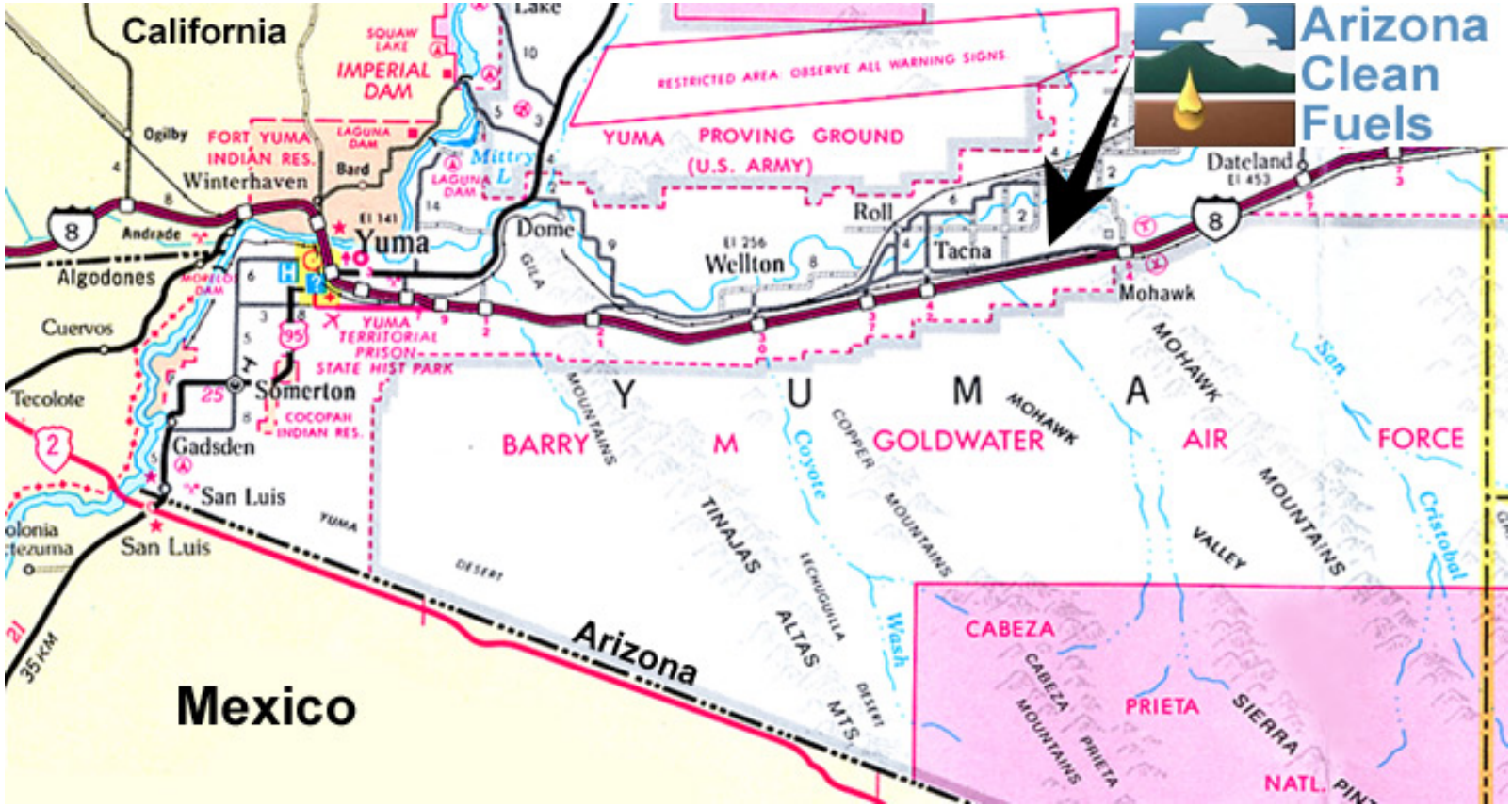
Review of Draft Permit

Arizona Clean Fuels
Proposed Petroleum Refinery
Yuma County, Arizona

August 11, 2004

Site Location



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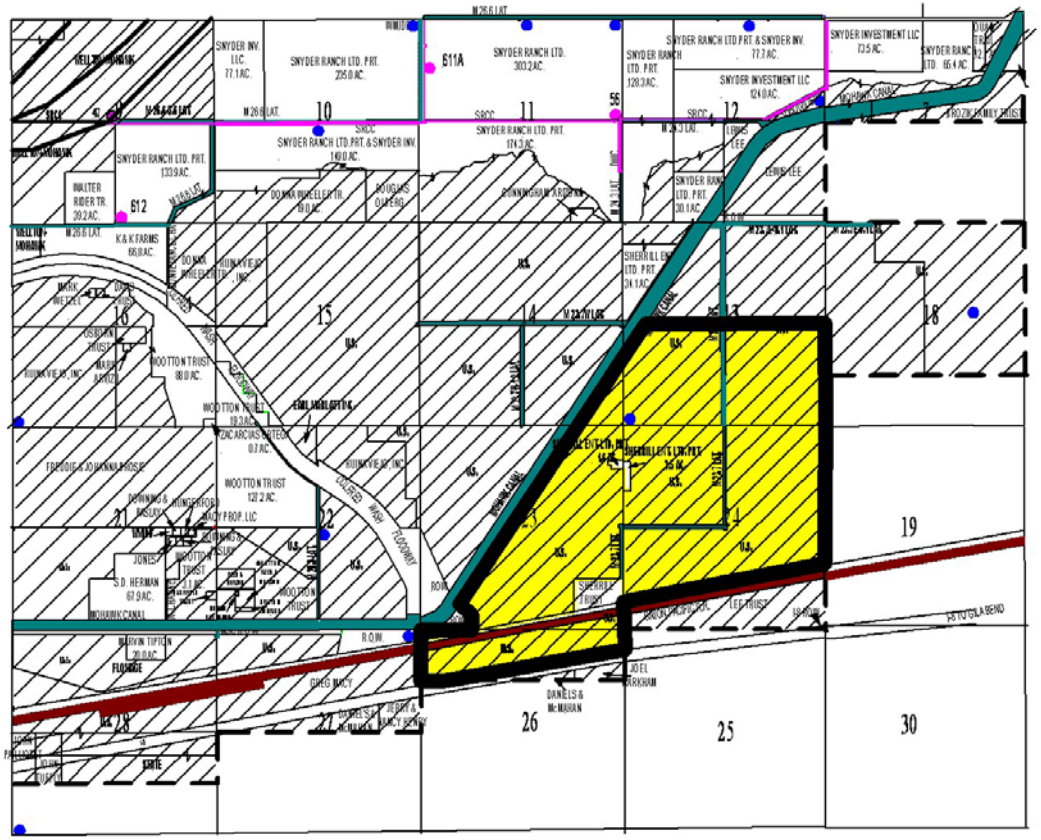
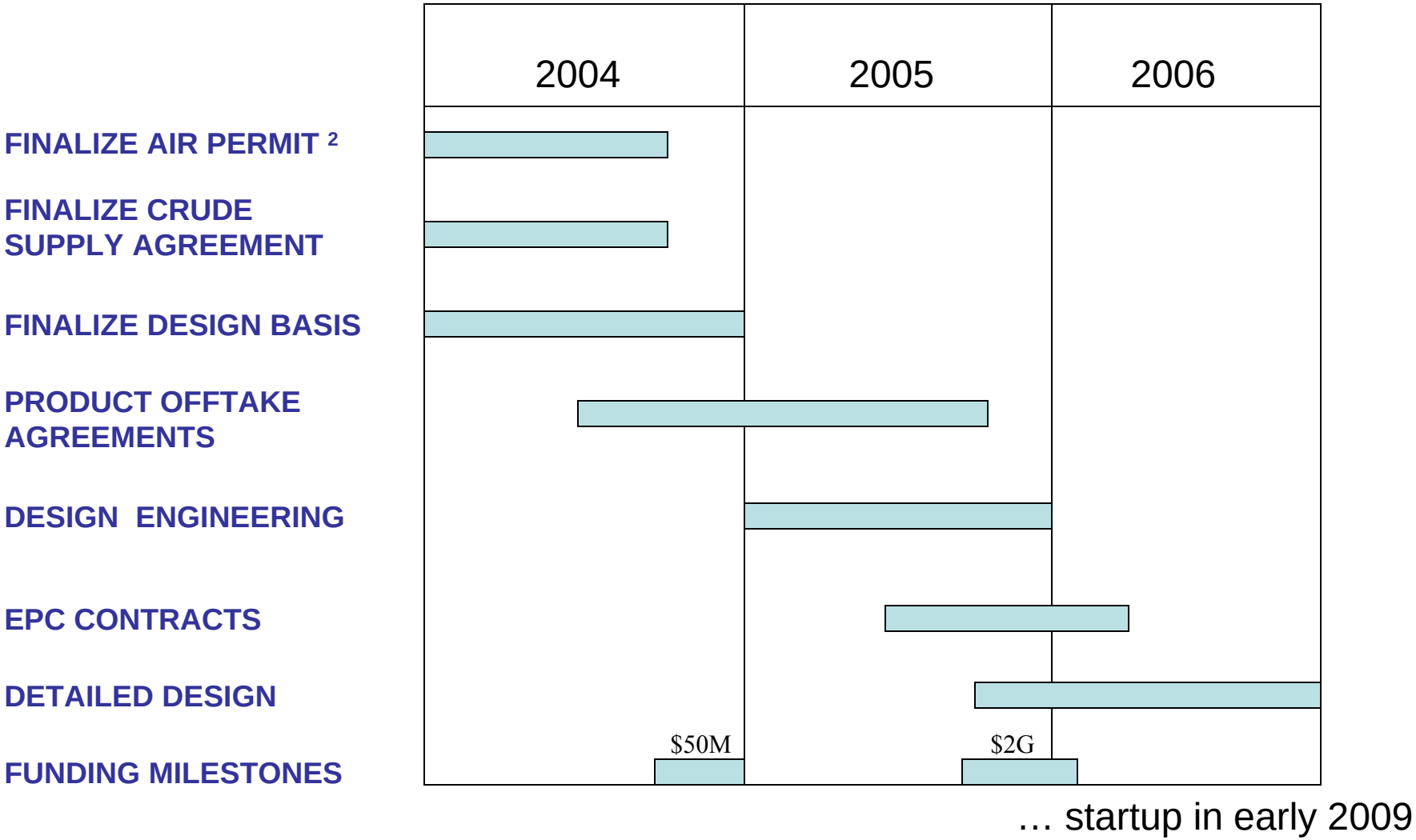


WELLTON - MOHAWK
IRRIGATION AND DRAINAGE DISTRICT
30570 WELLTON-MOHAWK DRIVE, WELLTON, ARIZONA 85366
TEL: (928)785-3351

ARIZONA CLEAN FUEL
SITE PROPOSAL

DATE
10-9-03
DRAWN BY:
S. DODD
DRAWING NAME
AZFUELB

Project Schedule [1]



… startup in early 2009

1. As presented by ACF in June 2004.
2. As presented by ACF. January 2005 is more realistic issuance date. Other dates may slip accordingly.

Refinery Production [1]

- Total fuels production approximately 150,000 barrels per day (BPD)
  - Approximately half of current statewide consumption [2]
- Gasoline 85,000 BPD
  - Approximately half of current statewide consumption, or
  - 90% of current Maricopa County gasoline consumption [2]
- Diesel fuel 35,000 BPD
- Jet fuel 30,000 BPD

1. As presented by ACF in June 2004.
2. Note that consumption rates increase by about 5% per year.

Feedstock Transportation [1]

- Primary crude oil
  - Supply via pipeline
  - Negotations underway with Pemex for pipeline access agreement
  - New terminal in NW Mexico to be owned/operated by a 3rd party
- Butane / natural gasoline
  - Supply via rail / pipeline

1. As presented by ACF in June 2004.

Product Transportation

- Permit includes rail and truck loading racks
- Sulfur and petroleum coke will be shipped by rail
- Company indicates that liquid products also will be shipped by pipeline to the Phoenix market and possibly to Mexicali distribution terminal

Ambient impacts

- PM_{10}
  - Maximum predicted concentration (including background) < 64% annual NAAQS
    - Of this, > 96% is attributable to background
  - Maximum predicted concentration (including background) < 54% 24-hr NAAQS
    - Of this, > 85% is attributable to background

Ambient impacts

- SO_2
  - Maximum predicted concentration (including background) < 15% NAAQS for all three averaging periods
  - Maximum predicted impacts from ACF $\leq$ 10% NAAQS
    - More than 45% is attributable to background

Ambient impacts

- NO_2
  - Maximum predicted impacts from ACF < 1% NAAQS
  - Cumulative analysis not triggered
- CO
  - Maximum predicted impacts from ACF < 2% NAAQS for both averaging periods
  - Cumulative analyses not triggered

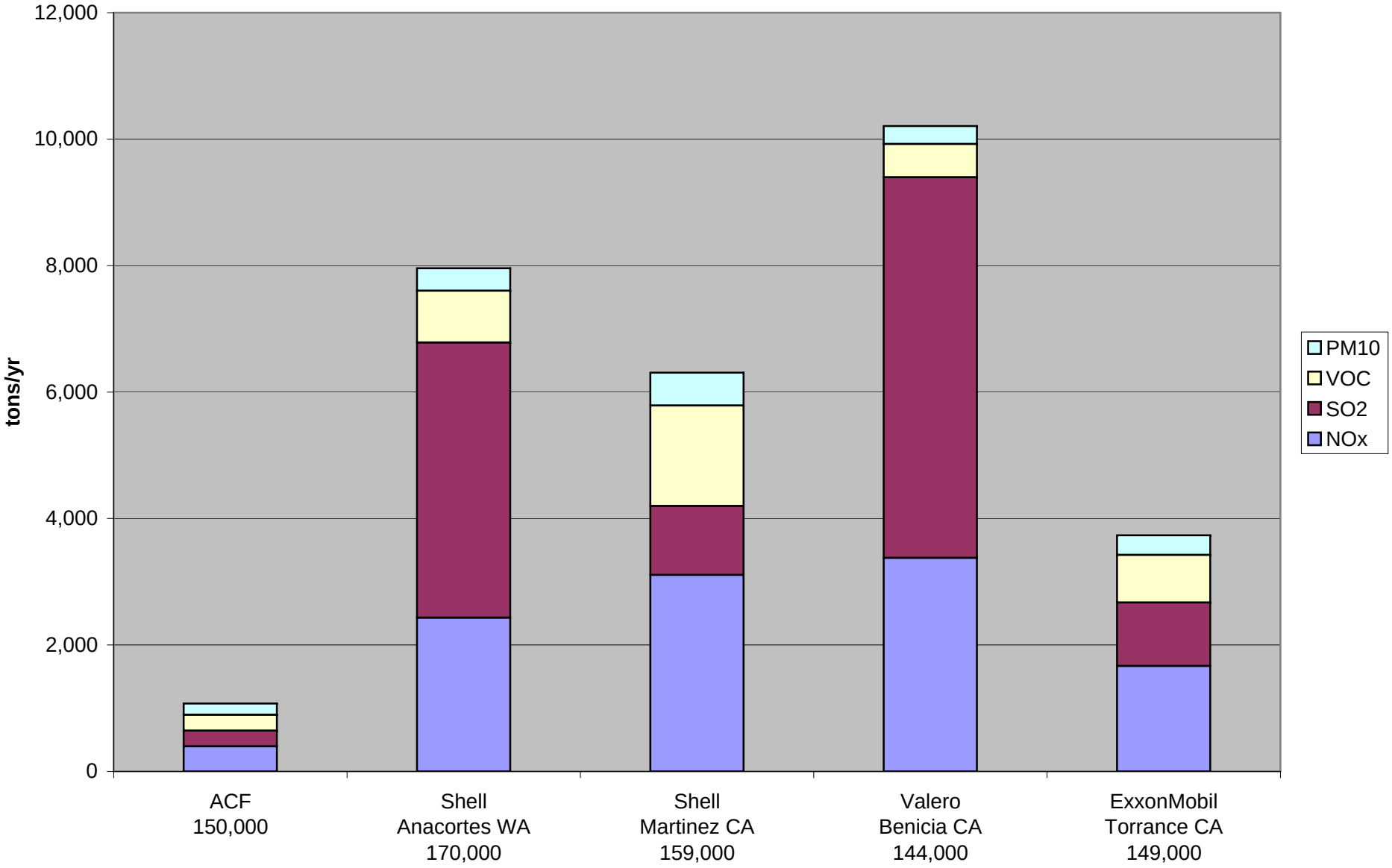
AAAQG Comparison

- Forty-six state air toxics were modeled for comparison with Arizona Ambient Air Quality Guidelines
- Modeled impacts are less than 10% of the AAAQG except for the following pollutants:

- Benzene (93%)
- Chlorine (74%)
- H_2S (47%)
- Silver (44%)
- Formaldehyde (28%)
- Selenium (28%)
- Mercury (20%)
- Cadmium (18%)
- Aluminum (16%)
- Lead (15%)
- Phenol (13%)
- Ammonia (11%)

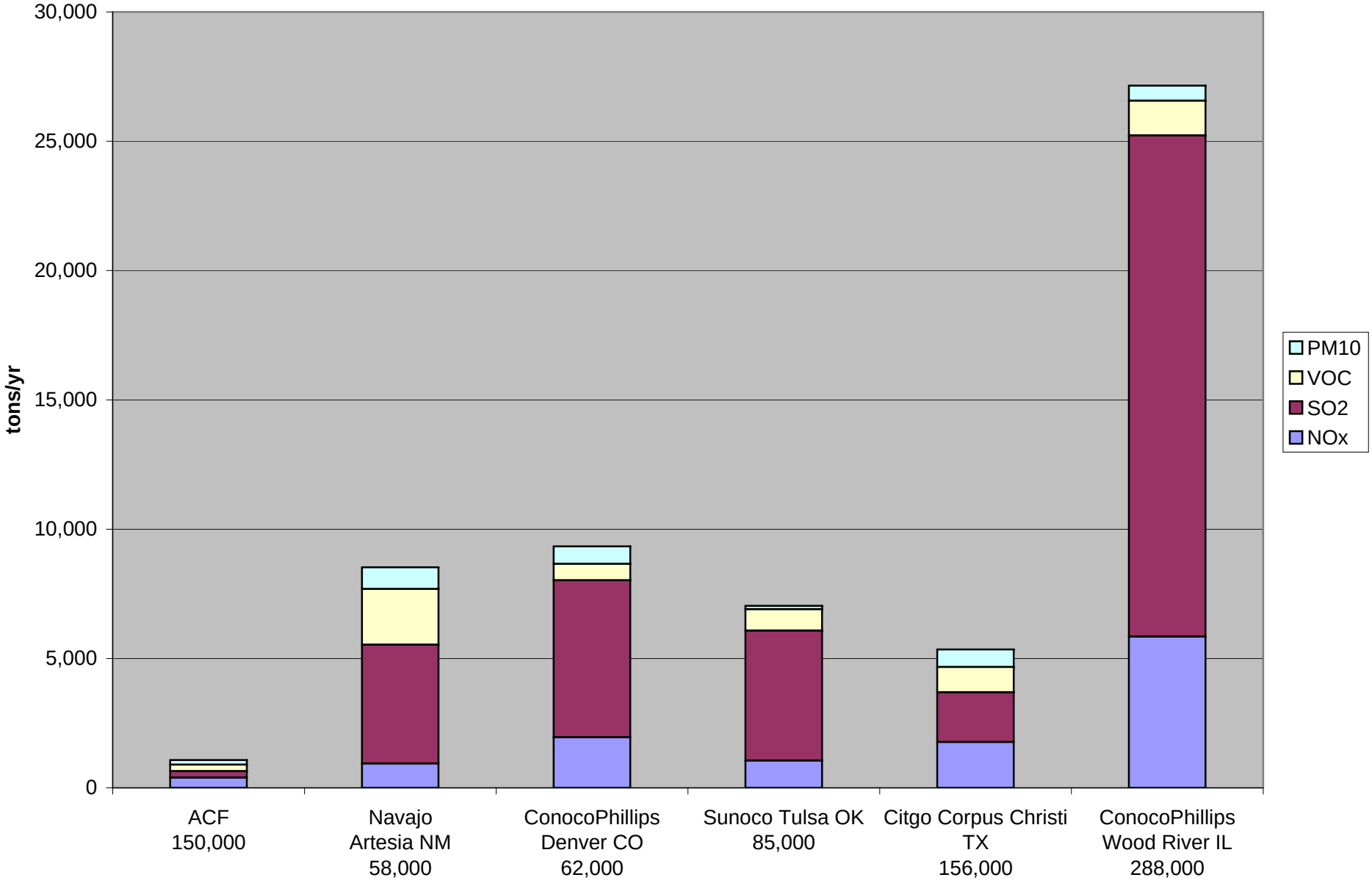
ACF vs. Calif. & Wash. Refineries

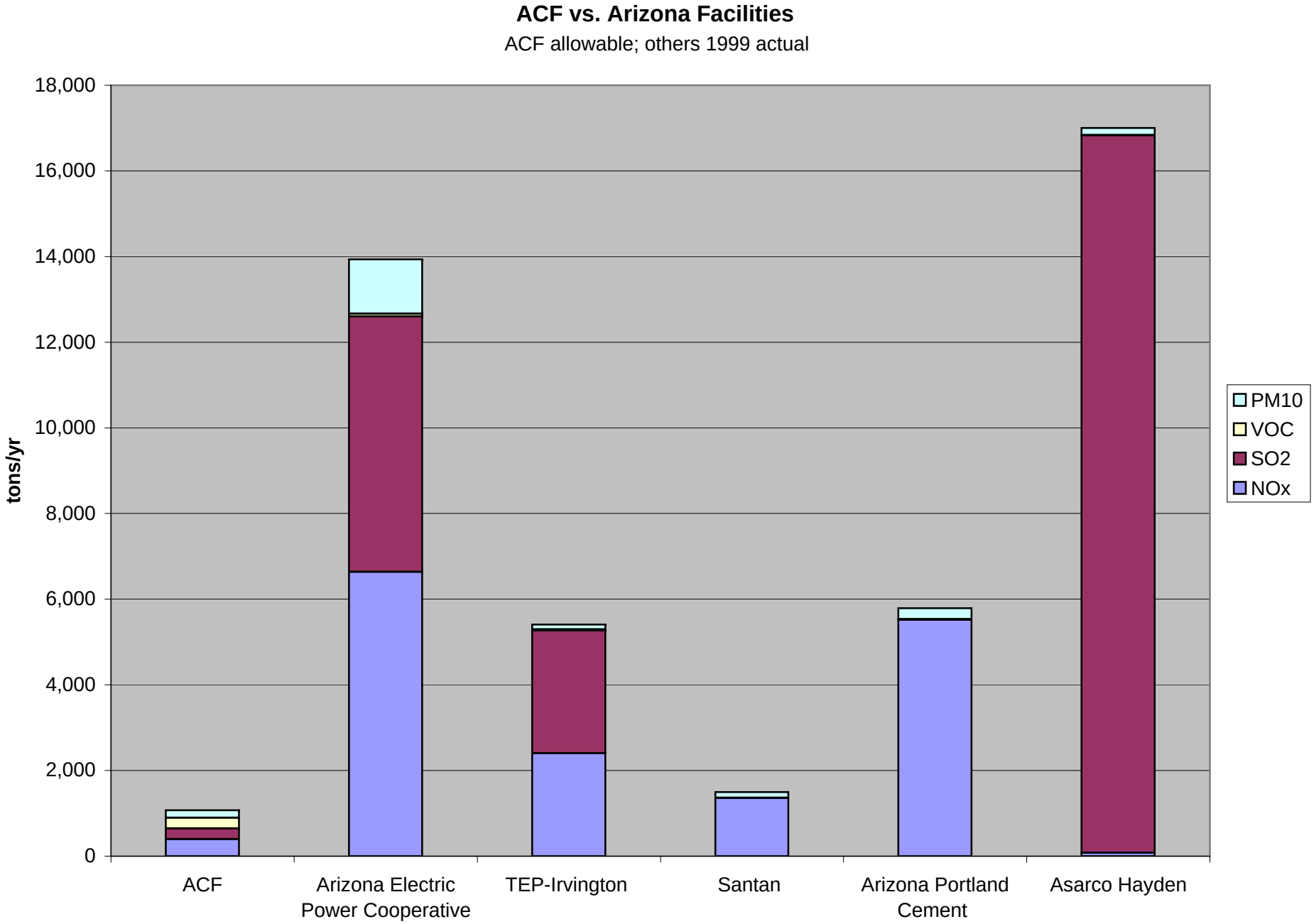
ACF allowable; Shell Anacortes 2001 actual normalized to 150,000 BPD; others 1999 actual normalized to 150,000 BPD

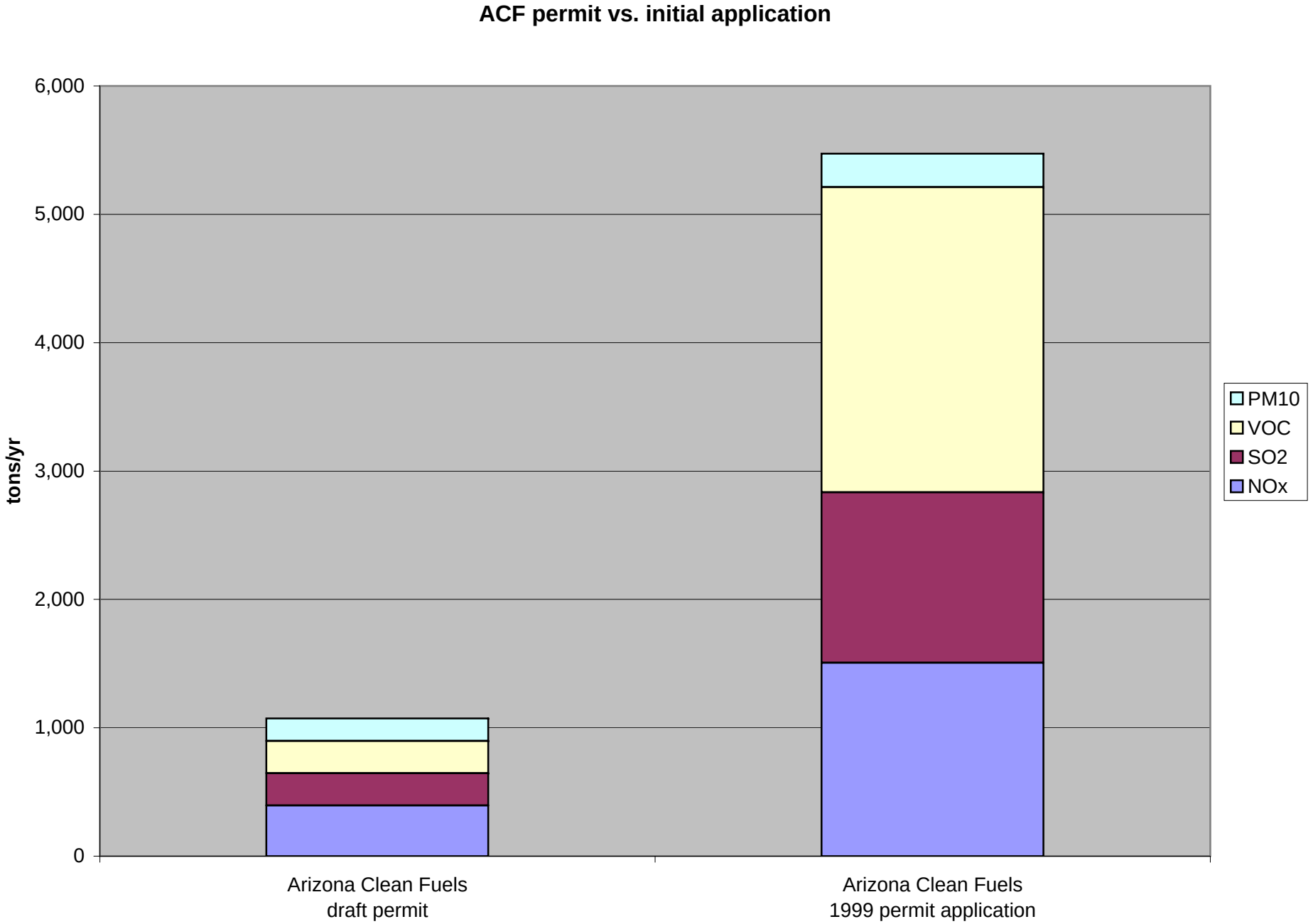


ACF vs. Other Refineries

ACF allowable; others 1999 actual normalized to 150,000 BPD




ACF vs. Arizona Facilities
ACF allowable; others 1999 actual
tons/yr
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
PM10
VOC
SO2
NOx
ACF
Arizona Electric Power Cooperative
TEP-Irvington
Santan
Arizona Portland Cement
Asarco Hayden

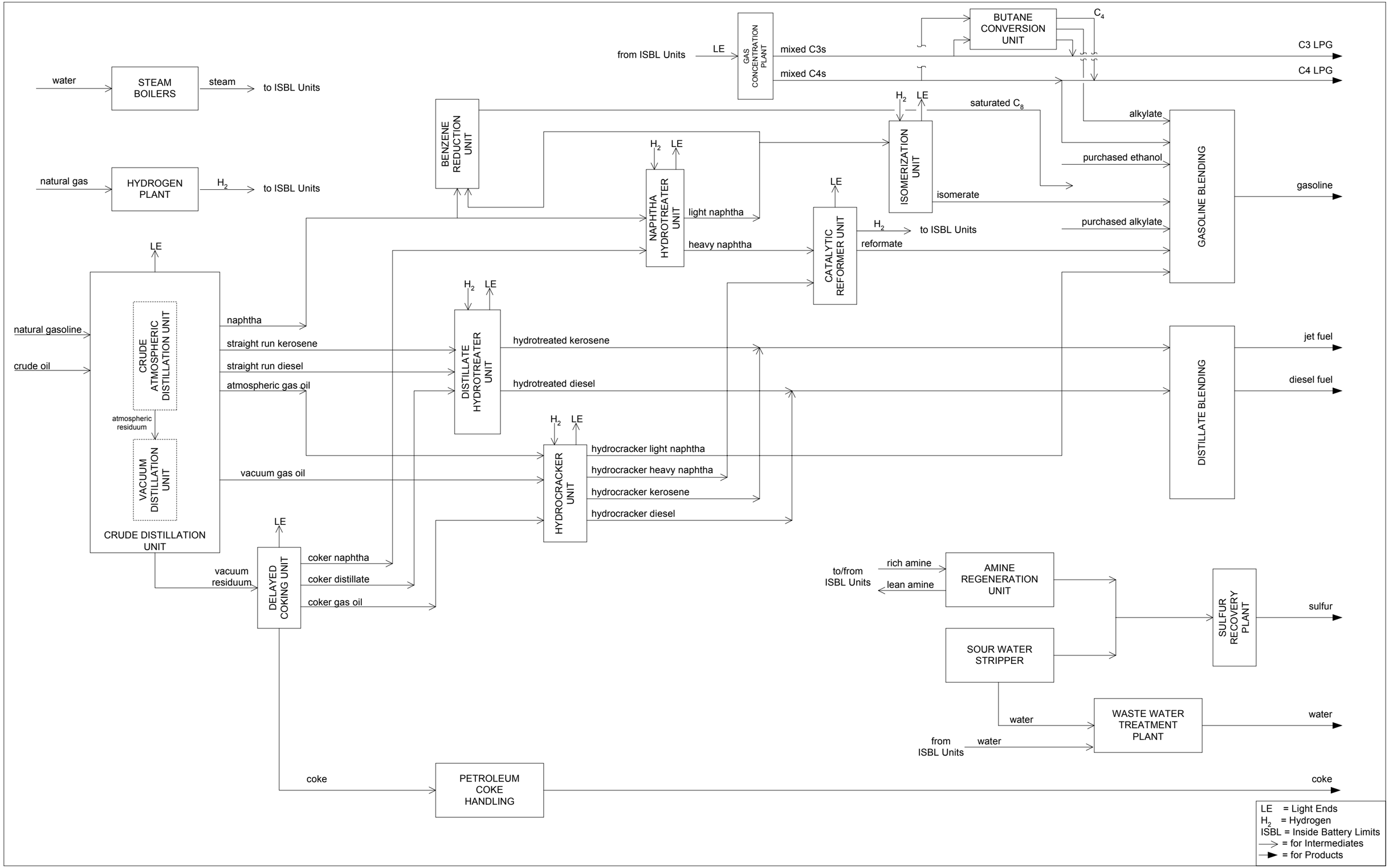

ACF permit vs. initial application
6,000
5,000
4,000
3,000
2,000
1,000
0
tons/yr
PM10
VOC
SO2
NOx
Arizona Clean Fuels
draft permit
Arizona Clean Fuels
1999 permit application

ACF Regulatory Situation

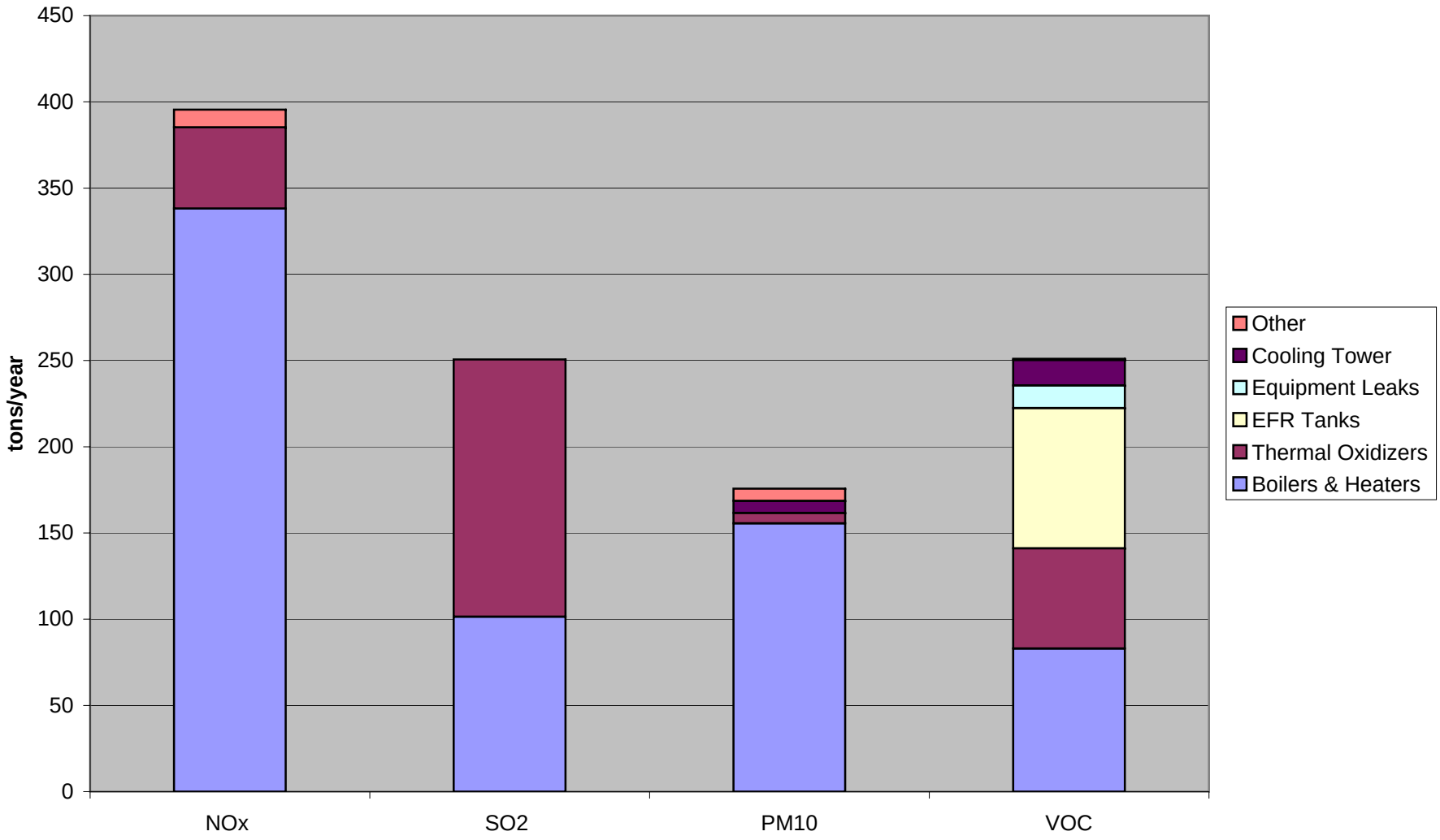
- Applicable CAA regulations
  - Eight “New Source Performance Standards”
  - Five “National Emission Standards for Hazardous Air Pollutants” (4 are MACT)
  - Prevention of Significant Deterioration

What a refinery can look like …

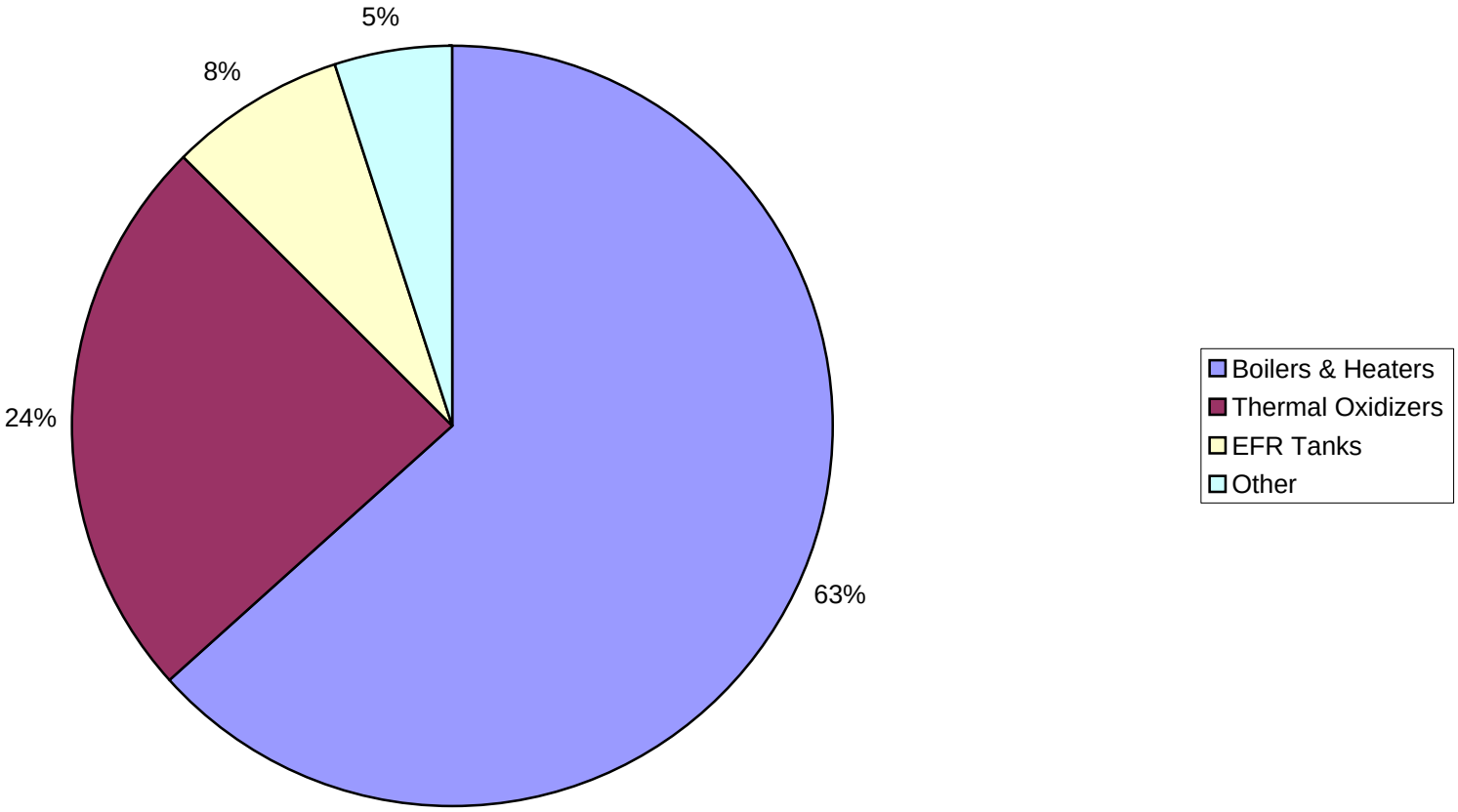
FIGURE II-A. SIMPLIFIED REFINERY PROCESS FLOW DIAGRAM



ACF Emissions Breakdown
(by pollutant)



ACF Emissions Breakdown
(Total NO_X, SO_2, PM_{10}, VOC by Source Type)



ACF Permit

- Refinery wide: piping / equipment leaks
  - BACT-required Leak Detection and Repair (LDAR) program is more stringent than any other refinery
  - Combines elements of BAAQMD LAER, Texas LAER, and federal MACT/NSPS
  - Largely responsible for benzene AAAQG conformance

ACF Permit

- Boilers and Process Heaters
  - NO_x BACT more stringent than any other refinery
    - SCR required for 7 of 18 process heaters
    - Controls approximately 75% of NO_X emissions
  - SO_2 BACT more stringent than any other refinery
    - 35 ppmv sulfur in fuel gas
  - No fuel oil combustion allowed
  - CEMS for SO_2, NO_x, CO, and (for SCR equipped heaters) ammonia

ACF Permit

- Thermal Oxidizers
  - BACT requires low-NO_x burners
  - CEMS for SO_2 and NO_x
  - Monitoring of temperature and flow rate to ensure continuously high VOC control efficiency
  - Limits and monitoring requirements are more stringent than any other refinery

ACF Permit

- Amine Unit, Sour Water Stripper & SRP
  - Normal Operation
    - BACT limits for SO_2 and H_2S based on 99.97 percent sulfur recovery efficiency
    - More stringent than for any other refinery
  - Emergency Operation
    - In emergency, without control, could emit 75 tons of SO_2 each hour
    - Contingency measures are more stringent than any other refinery
      - Curtailment of operation in 15 minutes
      - Excess capacity requirement is minimum of 24 hours

ACF Permit

- Tank Farm
  - "Group A" fixed roof tanks have no emissions
  - "Group B" internal floating roof tanks vented to thermal oxidizer
    - BACT-required 99.95% efficient VOC controls are more stringent than any other refinery
  - "Group C" external floating roof tanks meet new source MACT requirements
  - "Group D" pressure vessels have no emissions
  - "Group E" asphalt tank emits < 1 tpy VOC

ACF Permit

- Truck and Rail Car Loading Racks
  - Gasoline loading
    - BACT requires vapor recovery followed by RTO
    - VOC emission limit represents 99.99% control
    - More stringent than any other refinery
  - Distillate (diesel/jet fuel) loading
    - Thermal oxidizer at 98% control
    - More stringent than any other refinery (federal rules do not require any control)

ACF Permit

- Wastewater treatment plant
  - Drains controlled with dual carbon canisters
  - Vessels routed to thermal oxidizer with 99.9% design VOC control
  - More stringent than any other refinery

ACF Permit

- Emergency flares
  - Combustion of gases other than emergency releases prohibited
  - Emergency conditions require sampling, emission calculations, record keeping, reporting, and demonstration of unavoidability
  - More stringent than any other refinery